

Technology Transfer Alliance Industrial Outreach Effort Helping Louisiana Firm to Recycle Used Tires

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The Southeastern Regional Technology Transfer Alliance's industrial outreach effort has scored another success in working with Cryopolymers Inc., of St. Francisville, LA, to recycle the materials in worn-out vehicle tires.

Identified as a candidate for NASA technology transfer assistance by an industrial outreach team from the Marshall Center, a member of the alliance, a tire recycling system was devised in cooperation with engineers from Lockheed Martin's operation at the Stennis Space Center in Mississippi. They worked with Johnson Controls World Services, Inc., also at the Stennis Center, to take shredded vehicle tires, freeze them, and separate the rubber from the reinforcing steel belts and polyester fibers. The rubber which is recovered, called "crumb," is used in asphalt road beds and other items.

Anne Johnson, Technology Transfer Officer at Stennis, said, "The Cryopolymers project is a prime example of how NASA technology and expertise can benefit the public. The results of such collaborations (between NASA and private industry) can create jobs, increase profits and enhance economic competitiveness for the United States."

NASA personnel have been working with Cryopolymers to incorporate cryogenics (super-cold fluids such as liquid nitrogen and liquid hydrogen) into its recycling process. Stennis, as NASA's Center of Excellence for large propulsion engine testing, uses about 70 percent of all liquid hydrogen used by NASA.

Joe Kelley, director of community affairs for Cryopolymers, said the assistance from the Southeastern Alliance members has been "a blessing. The technology is there and we are purchasing equipment based on (alliance members') recommendations."

The most practical method of making "crumb" involves using liquid nitrogen to freeze the rubber to a temperature of -225 degrees Fahrenheit. Since the company has only been in business for a few months and the liquid nitrogen used in the process is extremely expensive, Cryopolymers was anxious to learn how to reduce the amount of liquid nitrogen needed to process the worn-out tires. Stennis helped Cryopolymers adapt its equipment to work in very cold temperatures and to better use cryogenic materials.

The "crumb" that is created from the cryogenic process can be broken down into various grades according to particle size. The largest particles are used to improve the wearability of road surfaces and can be reprocessed to mold products which must be weatherproof. Finer particles can be recycled to make new tires, agricultural hose, or mixed with plastics to produce culvert linings or beds for trucks. For each pound of rubber that is processed, 60 percent is reduced into crumb. The scrap metal and polyester residue also can be recycled into new products as a reinforcing fiber.

The importance of this recycling effort is best reflected in these statistics: More than 300 million tires wear out worldwide every year creating an enormous environmental disposal problem. Recycling techniques such as those developed for Cryopolymers are expected to recycle about 4,800 tires each day, recovering 4,000-lb of rubber every hour the plant is in operation.

Dr. Elizabeth Rodgers at the Marshall Center Technology Transfer Office is the primary NASA contact for Louisiana firms seeking assistance. She may be reached at Mail Code: LA20, MSFC, AL 35812; by telephoning 1-800-USA-NASA; or on the Internet by accessing <http://techtran.msfc>.

nasa.gov. She coordinates her efforts with Andy Bush at the Louisiana Department of Economic Development's Technology Transfer Office, operated by the Louisiana Business and Technology Center at Louisiana State University; and Gordon Dyer of Lockheed Martin Manned Space Systems in New Orleans. Through this team, Louisiana firms can access the technological expertise and resources of all 752 members of the Federal Laboratory Consortium. The alliance will provide up to 40 hours of technical assistance, free of charge.

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Biographical Sketch: Bob Lessels is the technical writer/editor (physical sciences) for the Technology Transfer Office at MSFC. A graduate of the University of Nebraska, he has been a professional journalist for the past 30 years. He joined NASA in 1986. ☐